

Imaging of Galileo Probe Entry Site on Jupiter: A Daytime Adventure

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The entry site of the Galileo Probe that entered Jupiter's Atmosphere on December 7, 1995 posed a challenge of observing Jupiter within a few degrees of the Sun. With the thought that it should be easier to use a solar telescope to observe Jupiter in the visible light with the planet within 15 degrees of the sun, use of the Solar Vacuum Tube Telescope of the Swedish Royal Academy of Sciences was pursued. The telescope is located on La Palma, Canary Islands at an altitude of about 2,400 meters. The diffraction limited seeing from the telescope was previously demonstrated to approach 0.2 arcseconds.

It was determined that the telescope objective needed shielding from the direct sunlight to prevent stray reflections from the edges of the primary mirror when the objective was pointed at a target within about 10 degrees of the sun, since the image of Jupiter was lost within the scattered light. A solar shade approximately 2.5 meters long was quickly designed and constructed from the limited materials available locally. After some initial failures, an attempt at constructing a light, deformable shade was successful that reduced the background scattered light sufficiently to reveal Jupiter. Jupiter was imaged successfully between 24 November 1995 and 4 December 1995 whenever the weather cooperated. After that the weather conditions (fog, mist and high winds) precluded observations of Jupiter until the probe entry. Many thousand images of Jupiter were acquired using B,V,R,I and Z filters as well as at narrow band filters at 750, 829 nm. A few images were obtained at 893 and 945 nm.

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